

VALUE ENGINEERING CHANGE PROPOSAL  
MISSOURI DEPARTMENT OF TRANSPORTATION

		Date <u>04/27/09</u>
Contract ID <u>081121-403</u>		Job No. <u>J4P1138C</u>
County <u>JOHNSON</u>	Route <u>13</u>	Original Bid Cost <u>\$11,601,154.84</u>
Contractor <u>IDEKER, INC</u>		By <u>DAN TARR</u>
Designed By _____		Phone _____
VECP # <u>09-35</u>		VECP <input type="checkbox"/> or VECPP/PDU <input type="checkbox"/>

1. Description of existing requirements and proposed change(s). Advantages/Disadvantages

Contractor is to install wick drains and then place a 2' sand drainage blanket to form a horizontal drainage layer. We propose to use prefabricated strip drains in lieu of the sand blanket. Advantages of strip drains are that they are faster to install allowing consolidation to start sooner and the wick drains provide better drainage. According to manufacturer's literature strip drains provide over ten times the flow capacity of a 36" sand blanket. The sand blanket will be contaminated over time while the strip drain is protected by a geotextile fabric.

2. Estimate of reduction in construction costs. \$352,738.94

3. Prediction of any effects the proposed change(s) will have on other department costs, such as maintenance and operations.

NONE

4. Anticipated date for submittal of detailed change(s) of items required by Section 104.6 of the Specifications.

04/28/09

(date)

5. Deadline for issuing a change order to obtain maximum cost reduction, noting the effect of contract completion time or delivery schedule.

NONE

(date)

(effect)

6. Dates of any previous or concurrent submission of the same proposal.

(date and/or dates)

Additional Comments:

**\*\* Portion Below This Line To Be Filled Out by MoDOT \*\***

**Comments:**

The plans call for the installation of Wick Drains and a two foot sand blanket to be installed at the following locations: Station 795+00 Station 803+52 to accelerate the process of the fill settlement. Ideker has presented MoDOT with the proposal of using Strip Drains in conjunction with the Wick Drains to provide the same results. This falls under the Practical Design Value Engineering criteria. Ideker, Inc. has requested payment for the discovery. I recommend the 75% owner /25% contractor Practical Design Value Engineering.

*John L. Voss*  
Submitted By Resident Engineer

4/28/09  
Date

**Comments:**

WE CONCUR WITH THE RECOMMENDATION OF THE RE  
BUT BELIEVE, DUE TO THE NATURE OF THE VE, THE  
CONTRACTOR MAY BE ENTITLED TO A 50/50 DISTRIBUTION  
OF THE SAVINGS.

- ☒ Approval  
Recommended  
☐ Rejection  
Recommended

*Elizabeth A. Velt* (PTV)

District Engineer

5/12/09  
Date

**Comments:**

THIS PROPOSAL IS A 50/50 VE. APPROVED  
PER DISTRICT RECOMMENDATION

- ☐ Approval  
☐ Rejection

*David D. Cooney*  
State Construction and Materials Engineer

5-26-09  
Date

Distribution: Resident Engineer, Project Manager, District Operations Engineer, State Construction and Materials Engineer  
\*Value Engineering Administrator - \*MoDOT, P.O. Box 270, Jefferson City, MO 65102

Strip Drain Value Engineering Proposal

Item Number	Description	Bid Quantity	unit	Revised Quantity	Unit Price	Contract Change
<b>Job Number 1138B</b>						
100	Compacting Embankment	290,725	CY	314,325	\$0.35	\$8,260.00
260	Sand Blanket	23,600	cy	0	21.39	(504,804.00)
290	Wick Drains	48,591	LF	54,083	0.68	3,734.56
790	Subsurface Drainage Geotextile	3,159	SY	0	2.32	(7,328.88)
new	Strip Drains	0	LF	9,861	1.85	18,242.85


**Total for Job 1138B** (481,895.47)

<b>Job Number 1138C</b>						
2640	Compacting Embankment	552,333	CY	569,493	0.46	7,893.60
2820	Sand Blanket	17,160	cy	0	21.55	(369,798.00)
2850	Wick Drains	39,521	LF	44,249	0.62	2,931.36
3210	Subsurface Drainage Geotextile	3,725	SY	0	2.31	(8,604.75)
new	Strip Drains	0	LF	8,021	1.85	14,838.85

**Total for Job 1138C** (\$352,738.94)

**Combined Total Change** (\$834,634.41)

Mike A  
Fritz/SC/MODOT@MODOT  
03/03/2009 03:37 PM

To Bruce A Harvel/D4/MODOT@MODOT  
cc Alan D Miller/SC/MODOT@MODOT, James W  
Sharp/D4/MODOT@MODOT, Jon G  
Voss/D4/MODOT@MODOT, Kevin W  
bcc  
Subject Re: Fw: Hydraulic capacity 

Bruce,


I talked to Jon Voss yesterday. We agree that as long as the strip drain has adequate capacity, the VE proposal should be okay.

Thanks,  
Mike

Bruce A Harvel/D4/MODOT



Bruce A Harvel/D4/MODOT  
03/03/2009 12:30 PM

To James W Sharp/D4/MODOT@MODOT  
cc Alan D Miller/SC/MODOT@MODOT, Mike A  
Fritz/SC/MODOT@MODOT, Jon G  
Voss/D4/MODOT@MODOT, Perry J  
Allen/D4/MODOT@MODOT, Kevin W  
McLain/SC/MODOT@MODOT, Thomas W  
Fennessey/SC/MODOT@MODOT  
Subject Re: Fw: Hydraulic capacity 

Jim,

You presented a good question. Off the top of my head, I currently don't have the answer. Historically MoDOT has used a sand blanket to drain any excess pore water pressure that gets generated. I realize the blanket thickness and the gradation of the sand influences the capacity of the blanket. I am assuming at some point time the hydraulic capacity of a 2' sand blanket may have been estimated with a specified gradation on past projects? I'm guessing it's a fairly easy calculation to perform.

In order to assist you, I am going to forward your question to the Central Office and see if they can help us out?

Ultimately, I can appreciate the contractors inquiry. I'm assuming, Ideker wants to select the proper strip drain to prevent any potential for a "blow out" as they pursue their VE proposal and the construction of the embankment?



Bruce A. Harvel  
District Geologist  
Missouri Department of Transportation  
600 NE Colbern Road  
Lee's Summit, MO 64086  
Office (816) 622-6522 Fax (573) 526-0031  
email Bruce.Harvel@modot.mo.gov  
James W Sharp/D4/MODOT



James W Sharp/D4/MODOT  
03/03/2009 11:02 AM

To Bruce A Harvel/D4/MODOT@MODOT  
cc


Subject Fw: Hydraulic capacity

Jim Sharp  
Senior Construction Inspector  
Clinton Project Office  
(660) 885-5665 (Office)  
(660) 890-5062 (Mobile)

----- Forwarded by James W Sharp/D4/MODOT on 03/03/2009 11:01 AM -----



Paul C Boenisch/D4/MODOT  
03/03/2009 10:55 AM

To James W Sharp/D4/MODOT@MODOT, Bruce A  
Harvel/D4/MODOT@MODOT  
cc Amy S Nash/D4/MODOT@MODOT, Dennis K  
Buckley/D4/MODOT@MODOT, Dwayne C  
Severs/D4/MODOT@MODOT, Jon G  
Voss/D4/MODOT@MODOT, Kevin W  
McLain/SC/MODOT@MODOT, Perry J  
Allen/D4/MODOT@MODOT, Regina R  
Shipley/D4/MODOT@MODOT, Richard S  
Uptegrove/D4/MODOT@MODOT  
Subject Re: Hydraulic capacity 

Jim,

The two foot thickness was provided by Bruce Harvel. Since this is a geology question, Bruce is the best person to contact to see if substitution is possible.

Paul

James W Sharp/D4/MODOT



James W Sharp/D4/MODOT  
03/03/2009 10:19 AM

To Paul C Boenisch/D4/MODOT@MODOT, Perry J  
Allen/D4/MODOT@MODOT, Amy S  
Nash/D4/MODOT@MODOT, Regina R



Shipley/D4/MODOT@MODOT, Kevin W  
McLain/SC/MODOT@MODOT  
cc Jon G Voss/D4/MODOT@MODOT, Richard S  
Uptegrove/D4/MODOT@MODOT, Dwayne C  
Severs/D4/MODOT@MODOT, Dennis K  
Buckley/D4/MODOT@MODOT  
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Jim Sharp  
Senior Construction Inspector  
Clinton Project Office  
(660) 885-5665 (Office)  
(660) 890-5062 (Mobile)



**Bruce A Harvel/D4/MODOT**

03/04/2009 10:28 AM

To Alan D Miller/SC/MODOT@MODOT

cc Perry J Allen/D4/MODOT@MODOT, Thomas W  
Fennessey/SC/MODOT@MODOT, Mike A  
Fritz/SC/MODOT@MODOT

bcc

Subject Re: Fw: Hydraulic capacity

We're thinking the same on this.....I was thinking about applying 1.25 SF which would bump it up to a minimal sustained load of 4688 psf?

The other thought I have..... are we comfortable that we can achieve an acceptable or comparable rate of settlement with the Ameri-drain versus the sand blanket? I think Mike may have hit on this or inferred this a little bit with the Hydraulic Capacity of the strip drain? I am assuming it will be OK? By contract, Structure No. A-7684 and A7477 requires the contractor to hold off or delay the approach slab and pavement construction for 5 months or until the settlement is complete? Structure No. A7475 has same type of delay, but it's 2 month's. Not 100% sure.....and I might be wrong, but I think these are structures associated with the Wick Drains. Once the 2 month and 5 month time period has passed, I'm assuming the contractor will want to start the approach slab and pavement construction regardless if we use the strip drain or the sand blanket.

**Bruce A. Harvel**  
District Geologist  
Missouri Department of Transportation  
600 NE Colbern Road  
Lee's Summit, MO 64086  
Office (816) 622-6522 Fax (573) 526-0031  
email Bruce.Harvel@modot.mo.gov

Alan D Miller/SC/MODOT



**Alan D Miller/SC/MODOT**

03/04/2009 09:57 AM

To Bruce A Harvel/D4/MODOT

cc Perry J Allen/D4/MODOT@MODOT, Thomas W  
Fennessey/SC/MODOT@MODOT

Subject Re: Fw: Hydraulic capacity

probably a little higher, height of fill, plus equipment running around on top of fill.

Alan D. Miller, M.S., P.E.  
Geotechnical Engineer  
Geotechnical Section  
Construction and Materials  
Bus. (573) 526-5730  
Fax (573) 526-4345  
alan.miller@modot.mo.gov  
Bruce A Harvel/D4/MODOT



**Bruce A Harvel/D4/MODOT**

To



03/04/2009 09:54 AM

Alan D Miller/SC/MODOT@MODOT

cc Perry J Allen/D4/MODOT@MODOT, Thomas W

Fennessey/SC/MODOT@MODOT

Subject Re: Fw: Hydraulic capacity

I guessing the Ameri-drain would need to be able to tolerate or sustain a minimal unit load.....say of 3,750 psf? or would we want something a little higher with a an appropriate factor of safety? Just pulling this off the top of my head?

We could require some type of manufactures certification if you think it would be needed?

**Bruce A. Harvel**  
**District Geologist**  
**Missouri Department of Transportation**  
**600 NE Colbern Road**  
**Lee's Summit, MO 64086**  
**Office (816) 622-6522 Fax (573) 526-0031**  
**email [Bruce.Harvel@modot.mo.gov](mailto:Bruce.Harvel@modot.mo.gov)**

Alan D Miller/SC/MODOT



Alan D Miller/SC/MODOT

03/04/2009 07:33 AM

To Bruce A Harvel/D4/MODOT

cc Mike A Fritz/SC/MODOT@MODOT, Perry J

Allen/D4/MODOT@MODOT, Thomas W

Fennessey/SC/MODOT@MODOT

Subject Re: Fw: Hydraulic capacity

We are thinking

1. Clear and grub the site
2. Install the pore pressure devices
3. Install a couple of feet of fill as a work platform
4. Install some additional fill in the middle to crown the fill 2' to provide drainage in all directions
5. Install the wick drains
6. Install the Ameri-drain perpendicular to C/L across the tops of the wick drains, daylighting at the

SL

We had a couple of concerns;

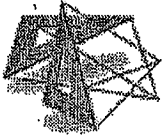
The contractor needs to verify the Ameri-drain will not crush under 30' of fill  
How do you connect the wick drains to the Ameri-drains.

I guess staples or maybe cut a slit in the Ameri-drain and insert the wick drain. Or maybe cut a slit all the way through the Ameri-drain, pull the wick drain thru, flop it over and duck tape it.

Alan D. Miller, M.S., P.E.  
Geotechnical Engineer



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alan.miller@modot.mo.gov  
Bruce A Harvel/D4/MODOT



**Bruce A Harvel/D4/MODOT**

03/03/2009 04:49 PM

To Mike A Fritz/SC/MODOT@MODOT  
cc Alan D Miller/SC/MODOT@MODOT, Thomas W  
Fennessey/SC/MODOT@MODOT, Perry J  
Allen/D4/MODOT@MODOT  
Subject Re: Fw: Hydraulic capacity

Mike,

Please take a hard look at this for us. I'm sure you guys will get hit up with the formal review of the contractors VE proposal before any kind of acceptance. If accepted, we most likely would like to have some type acceptable performance measures and language addressed in the Change Order.

Thanks a bunch!

**Bruce A. Harvel**  
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email Bruce.Harvel@modot.mo.gov

Mike A Fritz/SC/MODOT

**Mike A Fritz/SC/MODOT**

03/03/2009 04:26 PM

To Bruce A Harvel/D4/MODOT@MODOT  
cc Alan D Miller/SC/MODOT@MODOT, Thomas W  
Fennessey/SC/MODOT@MODOT  
Subject Fw: Hydraulic capacity

Bruce,

We can probably come up with something. I'm thinking 2' of sand is probably overkill for the drainage capacity, but Tom has some good points too. We'll also need to make sure the proposed drain has whatever capacity we need under the planned amount of fill.

We'll kick it around here tomorrow and give you our thoughts.

Thanks,  
Mike

----- Forwarded by Mike A Fritz/SC/MODOT on 03/03/2009 04:22 PM -----



Bruce A Harvel/D4/MODOT

03/03/2009 03:43 PM

To Mike A Fritz/SC/MODOT@MODOT

cc

Subject Re: Fw: Hydraulic capacity

Do we need to estimate the sand drain capacity as the project office has requested?

Bruce A. Harvel  
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Mike A Fritz/SC/MODOT

Mike A Fritz/SC/MODOT

03/03/2009 03:37 PM

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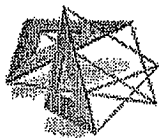


Bruce A Harvel/D4/MODOT

03/03/2009 12:30 PM

To James W Sharp/D4/MODOT@MODOT

cc Alan D Miller/SC/MODOT@MODOT, Mike A  
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Subject Re: Fw: Hydraulic capacity

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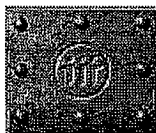
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James W Sharp/D4/MODOT



James W Sharp/D4/MODOT

03/03/2009 11:02 AM

To Bruce A Harvel/D4/MODOT@MODOT

cc

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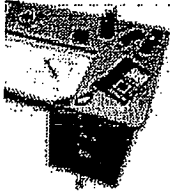


**Paul C**  
Boenisch/D4/MODOT

03/03/2009 10:55 AM

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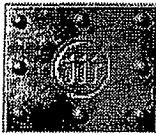
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# VALUE ENGINEERING CHECK SHEET

## TYPE OF WORK

(Check one that applies)

- ☐ Bridge/Structure/Footings
- ☐ Drainage Structures (RCP, RCB, CMP's, ect.)
- ☐ TCP/MOT
- ☐ Paving (PCCP, ect.)
- ☒ Grading/MSE Walls
- ☐ Signal/Lighting/ITS
- ☐ Misc. \_\_\_\_\_

## SUMMARY OF PROPOSAL

(If needed, condense summary to a couple of lines)

\_\_\_\_\_ Use wick drains in lieu of planned 2' sand drainage blanket.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## SCANNING OF DOCUMENT

If the proposal is large, please mark or make note, which pages need to be scanned into the database. If there are special instructions, make note of them here.

\_\_\_\_\_ Scan proposal only.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_